

-26-

**WHAT IS CLAIMED IS:**

1. A system for generating a molecular halogen gas, wherein the system comprises gas generation modules, wherein during normal operation, the system is designed to have at least one of the gas generation modules in standby mode.
2. The system of claim 1, further comprising a first molecular halogen storage container coupled to each of the gas generation modules.
3. The system of claim 2, further comprising a first hydrogen halide trap coupled to the first molecular halogen storage container.
4. The system of claim 3, further comprising a first filter coupled to the first molecular halogen storage container.
5. The system of claim 4, further comprising a second molecular halogen storage container, a second hydrogen halide trap, and a second filter, wherein:
  - the first and second molecular halogen storage containers are connected in parallel and coupled to each of the gas generation modules;
  - the first and second hydrogen halide traps are connected in parallel and coupled to each of the gas generation modules; and
  - the first and second filters are connected in parallel and coupled to each of the gas generation modules.

-27-

6. The system of claim 5, wherein:  
the first molecular halogen storage container, the first hydrogen halide trap, and the first filters are located within a first cabinet separate from the gas generation modules;  
the second molecular halogen storage container, the second hydrogen halide trap, and the second filter are located within a second cabinet separate from the first cabinet and the gas generation modules;  
the first hydrogen halide trap is located within a third cabinet; and  
the second hydrogen halide trap is located within a fourth cabinet.
7. The system of claim 1, wherein each gas generation module comprises an electrolytic cell and a rectifier.
8. The system of claim 1, wherein each gas generation module has its own cabinet.
9. The system of claim 1, wherein the molecular halogen gas is F<sub>2</sub>, and a feed material for the gas generation module comprises HF.

-28-

10. A system for generating a molecular halogen gas comprising gas generation modules, wherein each of the gas generation modules comprises a gas generation cabinet and an electrolytic cell within the cabinet.
11. The system of claim 10, wherein each gas generation cabinet comprises a single electrolytic cell.
12. The system of claim 11, wherein each gas generation cabinet further comprises a rectifier and a controller.
13. The system of claim 10, wherein the molecular halogen gas is  $F_2$ , and a feed material for the gas generation module comprises HF.

-29-

14. A system for generating a molecular halogen gas, wherein the system comprises gas generation modules, wherein each gas generation modules comprises:  
an electrolytic cell; and  
a rectifier coupled to the electrolytic cell.
15. The system of claim 14, wherein for at least one of the gas generation modules:  
the electrolytic cell and rectifier are part of a circuit;  
and  
each rectifier is sized to substantially prevent an explosion of the electrolytic cell in the event of an electrical failure within the circuit.
16. The system of claim 15, wherein the electrical failure includes an anode failure within the electrolytic cell.
17. The system of claim 14, wherein the rectifier is configured to be operated with only a single electrolytic cell at a time.
18. The system of claim 14, wherein the molecular halogen gas is  $F_2$ , and a feed material for the gas generation module comprises HF.

-30-

19. A method for using a system to generate a molecular halogen gas, wherein the system comprises gas generation modules and another unit, wherein the method comprises adding another gas generation module to the system, wherein additional equipment is not added to the other unit.
20. The method of claim 19, wherein the other unit includes a base unit or a feed unit.
21. The method of claim 20, further comprising modifying a header with the other unit.